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NOTES ON FOREST AND FRUIT TREES

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Notes on Forest and Fruit Trees.

HORTICULTURE.

Notes on Forest and Fruit Trees Growing on the Grounds of the Agricultural College Experiment Station.

BY E. S. RICHMAN.

The material for this bulletin is taken from notes collected during the last two years and from the present condition of the trees. All the trees, except where otherwise stated, were planted in the spring of 1890.

The winters of 1890–91 and 1891–92 were not exceptionally severe, the minimum temperature being 10° and 14° respectively, below zero, consequently they cannot be taken as conclusive in determining the hardiness of the plants in question, while on the other hand all plants suffering severely can safely be classed as not hardy, unless some other cause than temperature can be given for the injury sustained.

The average growth in all cases was estimated by taking measurements of a number (usually six) of the main branches and taking their average length. The maximum growth is that of the shoot making the greatest growth, it being usually the main stem. The number of trees of each variety of forest or ornamental trees measured was in most cases six.

Populus boleana. In 1890 the maximum growth was 3 ft. 9 in., and the average growth 2 ft. 2 in.; in 1891 the maximum growth was 5 ft. 8 in., and the average growth 3 ft. 8 in. The tree is clean and healthy and makes a shapely but not a spreading

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head. It is perfectly hardy as far as tried. The leaves are dark green above and covered with a white pubescense on the underneath side. One of the valuable poplars on account of its not shedding cotton.

Lombardy poplar (*Populus dilatata*). The first year after planting it made a maximum growth of 3 ft. 2 in., and an average growth of 2 ft. 5 in. The second year the maximum growth was 4 ft. 8 in., and the average 3 ft. 10 in. One of the six trees planted died the first winter without any apparent cause; the other five have not been injured in the least either of the two winters which they have stood. The tree is tall and straight and makes a very rapid growth; is of little value as a shade tree, but is used to a considerable extent in street planting and to plant in belts for wind breaks. In a cold climate it is a short-lived tree, and when it begins to die is very unsightly.

Carolina poplar (*Populus monilfera*). This is the common "cottonwood" of the Eastern and Mississippi valley states. Is perfectly hardy, and makes a good growth and a fine large tree, but its chief value lies in the wood it furnishes; it is not a desirable tree for lawns or street planting on account of its disagreeable habit of shedding cotton at the time of ripening of the seeds. Maximum growth the first year 2 ft. 6 in., average 2 ft. Maximum growth the second year 3 ft. 10 in.; average 2 ft. 6 in.

Populus Petrovsky. This and the following variety were very small trees when received, being only one year from cuttings. Maximum growth the first year 1 ft. 4 in.; average 1 ft.; second year the maximum growth was 3 ft. 3 in., and the average 2 ft. 7 in. This tree has a glossy green leaf and a spreading top, and from all appearances will make a shapely ornamental or shade tree.

Populus argentea. This tree has large leaves, green on the upper side and very white and downy on the under side; the leaf has three well-defined lobes with two secondary lobes at the base; in shape it is similar to the hard maple leaves. The first year after planting it made a maximum growth of 3 ft. and an average of 2 ft. 6 in.; the second year it made a maximum growth of 3 ft. 3 in., and an average growth of 3 ft. Its growth is spreading like the maples, and added to this the white downy appearance of the underneath side of the leaves and the new growth, it makes a fine appearance. Has developed no faults yet.

Balm of Gilead (*Populus balsamifera var candicans*). Is a rapid growing tree of spreading habit, but is undesirable except in forestry plantations on account of shedding cotton and sending up sprouts or suckers from the roots. The trees have been standing in their present position for several years. Maximum growth last year 4 ft. 1 in.; average 3 ft. 4 in.

The American Aspen or Quaking Asp (*Populus tremuloides*). —A few trees of this species were brought from the mountains last fall; the growth this season has not been more than 6 in., but the prospect is that they will succeed here in the valley. The aspen is quite a shapely tree, not very spreading, nor is it as straight and tall as the Lombardy poplar.

P. pulus Siberica. A tree of spreading habit; leaves are long, stiff and leathery; those on the newer wood are of a yellowish tinge; maximum growth the first year 1 ft. 1 in; average 8 in.; second year, maximum 2 ft 3 in.; average 1 ft. 8 in.

The poplars, as a class, are most valuable for timber and forestry plantations, though some admire their tall straight stems for ornamental purposes. Those that sprout or sucker from the roots or shed cotton are undesirable for ornamental purposes or for street trees.

Willows. Laural-leaved willow (*salix laurifolia*). The leaves are large and of a bright glossy green; a tree of very striking appearance. Maximum growth the first year 2 ft. 4 in., average 2 ft.; maximum the second year 4 ft.; average 3 ft. 2 in.

Salix fragilis. Is a vigorous growing tree, branches being long and slender; has a dark green foliage. Maximum growth the first year 2 ft. 4 in.; average 2 ft. 2 in.; maximum the second year 4 ft. 3 in.; average 3 ft. 4 in.

Yellow Willows (*salix aurea*). Hardy and doing well; growth the first year, maximum 2 ft. 6 in.; average 2 ft. 1 in.; second year 4 ft. 8 in.; average 3 ft. 8 in.

Salix rosmarinifolia. Presents a very striking appearance; has a long linear leaf and slender red branches; makes a very pretty ornamental plant. Maximum growth the first year 2 ft; average 2 ft. 2 in. Maximum growth the second year 2 ft. 8 in.; average 2 ft. 2 in.

Osier Willows. Several varieties of the Osier willow were received from the Department of Agriculture, Washington, D. C. So far they have proven perfectly hardy and adapted to this section of the country. Many of the cuttings are producing this, the third, year as many as forty strong branches suitable for basket work. The maximum growth is about 6 ft. 6 in., and the average about 5 ft.

Plane tree, Buttonwood or Sycamore (*Platanus occidentalis*). Maximum growth the first year 1 ft. 4 in. and the average growth 9 in.; maximum growth second year 1 ft. 7 in.; average 1 ft. 2 in.; has not proven altogether hardy; the ends of the limbs kill back during the winter. Several plants grown from the seeds on the grounds seem to stand the winter better, however.

Linden or Basswood (Tilia Europea). Has not winterkilled or been injured in any way, but so far the growth has been rather slow. The first year the maximum growth was 9 in., and the average 8 in.; the second year the maximum growth was 1 ft. 9 in. and the average 1 ft. 3 in. The trees are in an exposed position and get the full effect of a strong east wind, and the wood being soft and easily bent, the branches are all turned toward the west, thus making the tree rather ill-shaped; ordinarily, however, the tree is one of the finest for lawn planting where a fine large tree is desired.

European Alder (*Alnus incanna.*) A tree belonging to the birch family that promises to do well here. It is not easily affected by the winds and makes a shapely tree with dark green foliage. It made a maximum growth the first year of 1 ft. 8 in., and an average of 1 ft. 1 in.; the second year a maximum growth of 2 ft. 6 in. and an average of 2 ft.

American or White Elm (*Ulmus Americana.*) Is strong and healthy but has not done as well as it otherwise would, owing to its being located on a gravelly knoll where the soil does not retain the moisture very well. It made a maximum growth the first year of 1 ft. and an average of 10 in.; the second year the maximum growth was 1 ft. 8 in., and the average 1 ft. 2 in.

Silver Maple (*Acer dasycarpum.*) Has made just a fair growth but will not succeed well on the College grounds on account of the wind splitting and breaking off the branches. In locations where strong winds do not prevail it would probably succeed well and be a desirable tree. It made a maximum growth the first year of 1 ft. 4 in., and an average growth of 9 in.; the second year the maximum was 1 ft. 5 in., and the average 1 ft. 2 in.

Sugar Maple (*Acer saccharinum*). The sugar maple does not bear transplanting well and as a consequence makes slow growth for some years afterwards. The first year the growth did not average more than 3½ or 4 in., and the second year about 9 in. The sugar maple is a very desirable tree for shade and ornamental purposes and grows best when started from the seed where it is desired to have the tree; in this way it receives no set back from transplanting.

Box Elder or Ash Leaved Maple (*Negundo aceroides.*) This is a desirable tree on account of its rapid growth, hardiness and the formation of a dense shapely top. The first year it made a maximum growth of 1 ft. 8 in., and an average growth of 1 ft. 5 in.; the second year the maximum growth was 4 ft. 3 in., and the average 3 ft. 4 in.

Black Locust (*Robinia pseudadacia*). This is a rapid growing tree and valuable for fuel and posts. It has acted rather peculiarly here; some of the trees having the entire top die apparently from the effects of the winters, while others standing by their side were not injured in the least, though exposed in exactly the same way; young trees grown from the seed have been injured only slightly at the ends of the limbs. The first year after planting the maximum growth was 1 ft. 3 in., and the average growth 1 ft.; the second year the maximum growth was 3 ft. 3 in. and the average 3 ft. 1 in.

Black Walnut (*Juglans nigra*). A tree that does not readily bear transplanting on account of its long main or "tap" root and few lateral ones. The first year after setting the trees they did little more than live, making a maximum growth of 6 in., and an average of 3 in.; the second year the maximum growth was 9 in., and the average 7 in. The average this, the third, year will be 1 ft. or more, thus showing they are gradually recovering from the shock of removal. There are also several growing from the seed planted in the spring of 1890 which it is designed to let stand so as to have a standard of comparison between transplanted trees and those not transplanted.

White Walnut or Butternut (*Juglaus cinera*). Much the same habit of growth as the black walnut and like it the growth receives a severe set back by transplanting the tree; the growth the past three summers was practically the same as for the black walnut.

English Walnut (*Juglaus regia*). New growth is killed back during the winter some trees freeze to the ground; the growth made the present summer averages about 1 ft. 6 in. The tree stands the winters well and bears crops of nuts; however, not more than 100 miles south of Logan.

Pecan Nut (*Carya olivaeformis*). Owing to their location and the difficulty of transplanting them the trees all died but one the first year.

Filbert, (*Corylus Avellana*). A few plants of this bush were planted; they appear to be suited to this climate but no nuts have yet been produced.

Catalpa speciosa, a soft wood tree with large leaves and coarse branches. The new growth has winter-killed quite badly the past two winters. Maximum growth the first year 1 ft. 10 in., average 11 in.; maximum growth the second year 2 ft. 6 in., average 2 ft. The tree is valuable for lawn planting in places where it will prove hardy. It is also a valuable post timber.

European Ash (*Fraxinus excelsior*). This tree has made a good growth, but the strong winds to which it has been exposed have turned the branches nearly all to the West, making rather an ugly tree out of what otherwise would have been a fine tree. The first year the growth was small, the maximum being only 6 in. and the average 4 in.; the second year the maximum growth was 2 ft. 7 in. and the average 2 ft. 2 in.

Blue Ash, (*Fraxinus viridis*). Has made a very poor growth, the past three seasons it has not made an average growth of more than 2 in.; apparently it is perfectly hardy.

Mountain Ash. This tree seems to be doing well; the growth is strong and healthy, but slow, and the tree is shapely, the strong winds having little or no effect on it. The maximum growth the first year was 8 in. average 5 in.; maximum growth the second year 13 in., average 7 in.

Canoe Birch, (*Betula papyracea*). Is making a nice tree and to all appearances is a valuable addition to our list of ornamental trees; the maximum growth each of the two years tried has been 1 ft. 2 in. and the average growth 10 in.

Tree of Heaven, (*Ailanthus glandulosa*). This was grown from the seeds and has made a good growth and stood the winters without injury except at the ends of the branches. The first year after transplanting the maximum growth was 1 ft. 6 in. and the average 1 ft. 3 in.

Burr Oak, (*Quercus mac ocarpa*). Like all trees with a long tap root, unless specially treated for transplanting, it is hard to get started after transplanting. Last year it made a growth of 6 in. and this year of 8 in.

Swamp White Oak, (*Quercus bicolor*). Six trees of this were planted but only one, and that was planted on the side of an irrigating ditch, is now alive, has made an average growth each year of about 4 in.; oaks do best when raised from the acorn and not transplanted.

English Oak, (*Quercus Robur*). One specimen of this is growing on the grounds and has not yet been injured by the cold, average growth about 4 in.

White Pine (*Pinus strobus*). One of the finest of the evergreens where it will grow; the one winter it has stood here was very hard on it, the leaves all turned brown and fell off; a new growth has put forth but the trees have rather a sickly appearance.

Scotch Pine, (*Pinus Sylvestris*). Several specimens of this have stood the winters without injury, but it can not be compared with the white pine as it was entirely covered with snow, and therefore protected from the severity of the climate.

Spruce, (*Picea pungens*). A very desirable tree for ornamental purposes, running into all shades of color, from silver to dark green; five trees on the grounds have shown as many variations in color. Tree perfectly hardy so far, but the growth has been slow; the first two years only a growth of a few inches was made; the growth this year has been about 8 inches.

Norway Spruce, (*Picea excelsea*). Not as pretty a tree as the *P. pungens* and has been even slower in getting started.

White Spruce, (*Picea Alba*). Has not done satisfactorily; has made an annual growth of about 2 in.

Arbor Vitæ, (*Thuja occidentalis*). Is perfectly hardy and makes a fine looking tree. The first year the maximum growth was 12 in. and the average 9 in.; the second year the maximum growth was 1 ft. 6 in. and the average 1 ft. 1 in.

SPRING VS. FALL SETTING OF TREES.

This is a question that is not definitely settled, at least for the northern portion of the territory. In the fall of 1890 a selection consisting of forest and shade trees, apple, plum and pear were planted with a view to determining which is the better time for planting. Without exception the trees planted in the fall did better than those planted in the following spring. The increased growth was more noticeable the first year, but was noticeable to some extent the second year. The mildness of the winter may have had something to do with the result, however. With poplars the difference in growth was at least 6 inches in favor of the fall set trees. With the fruit trees the difference was not more than 3 inches on an average.

FRUIT TREES.

In the spring of 1890 there was set out on the experiment station grounds about 85 varieties of apples, 35 varieties of pears, 25 varieties of plums, 27 varieties of cherries, 35 varieties of peaches and 5 varieties of apricots.

In most cases 2 of each variety were planted. So far the apples all seem hardy and have made a fair, though not a big growth. None of them have yet fruited.

Following is a list of varieties:

Alexander,
Autumn Bough,
Babbitt,
Bradford's Best,
Charlotten Thaler,

Arkansas Black,
Autumn Strawberry,
Baldwin,
Brightwater,
Chenango Strawberry,

Cole's Quince,
Dickinson,
Duchess of Oldenburg,
Early Ripe,
Early Trenton,
Fall Pipen,
Fulton,
Golden Russett,
Haas,
Jonathan.
Kinnard's Choice
Landsberg Reinette,
Lansingburg,
Longfield,
McIntosh Red,
Mammoth Black Twig,
Marshall Red,
Minkler,
Newton Pippin (yellow),
Pickard's Choice,
Rawle's Janet,
Red Beitigheimer,
Romanite Gilpin,
Boxburry Russett,
Scarlet Cranberry,
Stark,
Tolman,
Thaler,
Walbridge,
White Pippin,
Wine Sap,
Yellow Transparent.
Crawford,
Dominie.
Early Harvest,
Early Strawberry,
Everbearing,
Fameuse,
Golden Reinette,
Grimes Golden,
Isham Sweet,
King of Tompkins County,
Lady Apple,
Lankford,
Lawver,
Loy,
Maidens Blush,
Mann,
Melon Apple,
Northern Spy,
Pewaukee,
Porter,
Red Astrachan,
Rhode Island Greening,
Roman Stem,
Rubicon,
Shanon Pippin,
Summer Rambo,
Tetofski,
Titus,
Wealthy,
Willow,
Yellow Belleflower.

Although the foregoing list of apples has sustained no injury from cold weather, it does not follow that they would be hardy in all situations. The college grounds are located some 200 feet or more above the main part of the valley, and the air is therefore warmer and dryer than that which settles in the valley below, and the canyon wind, of which we receive the full benefit, keeps off the frosts for several days after everything in the valley has felt its effect, thus giving a longer time for the ripening of the wood and a corresponding advantage in enduring the cold later on.

PEARS.

No injury has yet been sustained on account of the severity of the climate; all the varieties have done fairly well, but the following are making the best growth:

Flemish Beauty,
Winter Bergamy,
Sugar,
Bartlett,
Seckel,
Glou-morceau,
Garber,
Howell,
White Doyenne,
Jones' Seedling,
Mt. Vernon,
Butter,
Bousock,
Bessenmianka.

The following varieties are fruiting this year, carrying from one to seven specimens each:

Beurre Clairgeau,
Bartlett,
Margaret (dwarf),
Kieffer (dwarf),
Mikado.

Below is the full list of varieties planted:

Bartlett,
Beurre Clairgeau,
Beurre Easter,
Bessemianka,
Bousock,
Buffum,
Butter,
Clapp's Favorite,
Duchess,
Duchess d'Angouleme,
Duchess De Jersey,
Flemish Beauty,
Fred Clapp,
Garber,
Glou-morceau,
Howell,
Idaho,
Jones' Seedling,
Kieffer (standard and dwarf),
Le Conte,
Mikado, or Hubbard's Japan,
Margaret (standard and dwarf),
Mt. Vernon, (standard and dwarf),
Seckel,
Sapienganka,
Summer Doyenne,
Sugar,
Victor,
Tyson (standard and dwarf)-
Winter Bergamy,
White Doyenne.

PLUMS.

A few varieties are fruiting this year, but the trees are small and most of them without fruit. The following varies ties are growing in the experimental orchard:

Cheney,
De Soto,
Forest Garden,
Forest Rose,
Free Damson,
Garfield,
Gen. Hand,
Green Gage,
Hawkeye,
Lombard,
Maquoketa,
Miner,
Pond Seedling,
Poole's Pride,
Prairie Flower,
Prunus Simoni,
Quaker,
Rolling Stone,
Shropshire Damson,
Silver Prune,
Wild Goose,
Wolf,
World Beater.

All are making a fine growth excepting Prunus Simoni which does not seem to be in healthy condition. It has four fine specimens of fruit, however.

Two Wolf plum trees are full of fruit. They will ripen more fruit than all the others combined.

Next to the Wolf, Quaker has the best showing of fruit. Desoto and Lombard are both carrying a few fine specimens.

The Silver Prune has killed back both winters since it has been growing here. All the others named above seem to be perfectly hardy.

CHERRIES.

All the trees seem to be healthy and in good condition. All are making a good strong growth, and some of them had a few scattering cherries last spring. The varieties planted are as follows:

Abbess,
Belle de Choisey,
Belle De Montreal,
Bessarabian,
Black Eagle,
Black Tartarian,
Carnation,
Brusseler Braum,
Double Natte,
De Ostheim,

Early Richmond,
George Glass,
Grotte Du Nord,
King's Amarelle,
Lieb,
Mt. Large,
24 Orel,
27 Orel,
Rockport,
Spate Amarelle,
Vilne Sweet.
Early Purple,
Galopin,
Grotte Precoll,
Koeper,
Late Duke,
Lutooka,
23 Orel,
26 Orel,
Red Muscatell,
Skanka,
Shadow Amarelle,

PEACHES.

Peach trees have stood the past two winters with varying degrees of success and failure. As difference in hardiness is distinguishable in different varieties, notes will be given on each separate variety showing its present condition and past injury.

Beer's Smock winter-killed the first winter in orchard. The trees in this case and all cases following, where all the trees of a variety died, were on rather lower land than the others, and consequently the ground was wetter and probably was the cause of the loss.

BELYEU'S LATE.—One tree alive and one died the first winter after planting; the new growth on the remaining one killed back about sixteen inches last winter.

BOKAR.—This variety was planted a year later than the others; young growth killed back from one to six inches.

BRANT'S MEL.—New growth ail killed back the first winter, the second winter killed back about six inches.

BRAY'S R. R.—Only the ends of the limbs were injured by the cold, from two to six inches being killed. The two trees have about three dozen peaches on them.

CHRISTIANA.—From 1 to 2 inches of the new growth winter-killed; they have no fruit on them.

CRAWFORD'S EARLY—Seems to be very tender, the young growth killed back for about 18 inches; is bearing no fruit.

CRAWFORD'S LATE.—New growth winter-killed 2 to 6 inches, no fruit.

CRIMSON BEAUTY.—Was doing well until hooked down by cattle.

EARLY DELAWARE.—From 2 to 10 inches of new wood winter-killed; has no fruit on it.

EARLY RIVERS.—One tree died the first winter in orchard, the other one killed back the past winter about 6 inches and is fruiting this year.

EARLY ST. JOHN.—New wood killed back from 3 to 15 inches last winter, the tree is fruiting this year.

FOX'S SEEDLING.—Stood the first winter but was killed to the ground the second.

GEARY.—Both trees are yet alive but the new wood is killed almost entirely back each winter and it is bearing no fruit.

GLOBE.—One tree winter-killed and the other one was hooked down by cattle.

HEATH FREE.—New wood killed back last winter from 1 to 10 inches, is bearing a few peaches this year.

HEATH CLING.—Is only slightly injured by last winter's cold; has a few peaches on.

HYNES' SURPRISE.—Both trees dead, winter-killed.

LA GRANGE.—One tree died the first winter in orchard, the other passed through last winter without any injury.

LAST OF SEASON.—One tree winter-killed the first winter, the other killed back about 6 inches last winter; has a few peaches this year.

LORD PALMERTON.—From 3 to 6 inches of the new growth killed back last winter; is a fine tree, but has no fruit this year.

MRS. BRETT.—One tree winter-killed, the other injured 2 or 3 in. in the new growth; is fruiting this year.

MCNEIL.—One or two inches of the new wood injured; is fruiting this year.

MT. ROSE.—Both killed the first winter.

NORTH AMERICAN APRICOT.—Three or four inches of new wood killed last winter; no fruit.

NORTH CHINA.—Nearly all the new wood winter-killed.

OLD MIXON FREE.—Killed back from 6 to 12 inches last winter; is bearing no fruit.

POOLE'S ISLAND.—One tree dead and one alive; last winter only injured it slightly; no fruit.

PRESIDENT.—One to six inches of new wood injured last winter; is fruiting this year.

PRINCESS R. R.—One tree died first winter; 15 to 18 inches of the remaining one winter-killed last winter; is not fruiting.

REEDING.—Injured very slightly; is bearing no fruit.

RIVER BANK.—Killed back from 1 to 12 inches; a few specimens of fruit.

SCHUMAKER.—Both trees winter-killed the first year.

STARK.—Only slightly injured on the ends of the branches; is bearing fruit.

STEVEN'S R. R.—Only injured to a small extent; is fruiting well.

WATERLOO.—Both trees winter-killed the first winter.

BUDD, Gibb, Alexander and Catharine apricots are doing well; none of them fruiting yet.